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ABSTRACT

This study examined the following issues: (a) If vocabulary effects are minimized, will there be SES differences in the use of conditional forms by Caucasian children who have reached the fifth grade? (b) Even if SES differences occur in the use of recognizable conditional forms, will children within the same SES be able to transmit conditional information to one another? (c) If SES differences are found in transmission of conditional information, are they attributable to lack of comprehension of the conditional logic, or to difficulty in expressing the logic? One hundred and thirty-two fifth grade Caucasian children, who were divided into lower and middle SES groups of approximately equal IQ. Dyads were formed by combining children into the four possible speaker-listener combinations. The task required speakers to use a conditional communication in describing the rules of a game to a listener. Results showed that, as listeners lower and middle SES children responded equally well to the communications of both lower and middle SES speakers. However, as communicators, the lower SES children performed more poorly than the middle SES: All listeners had equally great difficulty following the instructions provided by the lower SES communicators. The data suggests that SES difference can not be attributed to lack of comprehension of the conditional logic. Instead, it appears that the lower SES children were difficult to understand because of strong tendencies toward egocentric communicational patterns. (Author/JM)

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SOCIAL-CLASS, CONDITIONAL COMMUNICATION,

AND EGOCENTRIC SPEECH

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SOCIAL-CLASS, CONDITIONAL COMMUNICATION, AND EGOCENTRIC SPEECH

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Abstract

Social class differences in ability to communicate conditional information were studied using 132 fifth grade caucasian children, who were divided into lower and middle SES groups of approximately equal IQ. Dyadic grouping were formed by combining lower and middle SES children into the four possible speaker-listener combination. The task required speakers to use a conditional communication in describing the rules of a game to a listener. Results showed that, as listeners lower and middle SES children responded equally well to the communications of both lower and middle SES speakers. However, as communicators, the lower SES children performed more poorly than the middle SES: both lower and middle SES listeners had equally great difficulty following the instructions provided by the lower SES communicators. The data suggests that SES difference can not be attributed to lack of comprehension of the conditional logic. Instead, it appears that the lower SES children were difficult to understand because of strong tendencies toward egocentric communicational patterns.

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SOCIAL CLASS, CONDITIONAL COMMUNICATION, AND EGOCENTRIC SPEECH

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A number of important studies have explored the relationship between socio-economic status (SES) and the ability to use language as a communicational vehicle. The data typically show that lower SES children perform less adequately than middle SES children, even when I.Q. is controlled. Indeed, class has typically proven to be much more critical even than race in determining the ability to communicate via language (e.g., Baldwin, McFarlane, & Garvey, 1971). However, many of these studies were concerned primarily with what may be called the "cultural-gap" hypothesis, and thus these studies were relatively global with regard to isolating the nature of any observed differences.

The cultural-gap hypothesis, implicit in many of these early studies, postulated that the reason many middle class observers have difficulty understanding lower class speech is because of a cultural gap between listener and speaker; further, it was postulated that, had the observer been a lower class child, he would not have had this difficulty with comprehension. The alternative hypothesis was that lower SES children are deficient in their communicational performance relative to middle SES children.

For the most part, the data support the deficiency hypothesis. However, since these data were designed to test the viability of the culture-gap hypothesis, little information was collected to determine whether the observed deficiencies were due to anything more than the well established fact that lower SES children have an inadequate vocabulary. For example, Peisach (1965) reports an important study on the gap hypothesis employing the cloze technique. This technique consists of E randomly deleting words from a message; an S is

then asked to read (or listen to) the message and as he arrives at each deletion, S is to guess the word that was deleted. In Peisach's study, lower and middle SES fifth graders both read and listened to messages from other lower and middle SES fifth graders. She found that both lower and middle SES children performed equally well on messages from lower SES communicators. This indicates that middle SES children were not at a disadvantage in interpreting lower SES language. However, even with intelligence controlled, middle SES children performed significantly better than lower on messages from middle SES communicators.

Several studies have indicated that middle SES children are superior to lower SES both in describing events in a manner that others can evaluate, and also in their ability to evaluate descriptions made by others. Krauss and Rotter (1968), for example, required 7- and 8-year olds to describe novel nonsense forms which were chosen for their low codability. Then, these descriptions were presented to listeners who were required to decide the nonsense figure most appropriate to each description. Krauss and Rotter found that middle SES listeners were more accurate than lower whether responding to messages from middle or lower SES communicators. Further, the middle SES communicators were responded to more accurately than the lower SES communicators whether the listener was middle or lower SES. These effects were strongly significant, even with intelligence controlled. The source of these effects could, of course, be perceptual (lower SES children may simply not discriminate the relevant cues of the environment in an adequate fashion). However, the results could again be attributable to vocabulary differences; lower SES children may not have a vocabulary adequate to describe novel stimuli; further, they may not have an adequate vocabulary to recognize an object when it is described to them. On the other hand, as far as lower SES communicators are concerned, adverse vocabulary effects may be compounded by a tendency to respond in terms of subjective reactions to the stimuli, rather than a more objective

reaction (i.e., in Piaget's terms, 1926, the lower SES children may be engaged in egocentric speech).

Baldwin, McFarlane, and Garvey (1971) have extended the Krauss and Potter study by (a) using meaningful pictures rather than nonsense forms, and (b) permitting the listener to ask questions concerning the stimuli. In this study, however, both members of a communicational dyad were from the same SES; thus communicator effects could not be distinguished from listener effects. A significant effect due to SES was found, with lower SES children performing more poorly than middle. As in the Krauss and Rotter study, the results may be at least partially attributable to perception, vocabulary, and/or egocentrism. The listeners were presented with seven very similar stimulus pictures which differed in small details (e.g., seven birds which differed in that the mouth was open or shut, was wearing a crown or beret, had knobby or smooth knees, and had a fluffy or smooth tail). It was necessary for the listener to note the various differences and request information that he felt would assist in the discrimination. This study is particularly interesting in that it indicated that permitting the listener to ask for supplementary information does not necessarily eliminate the SES differences in performance.

Several investigators have provided relatively direct evidence on the contention that lower SES children are more likely than middle to engage in what Piaget has referred to as egocentric speech. Loban (1963), for example, shows that lower SES children often use language in such a manner that it is difficult for the listener to know what the referent is for a particular sentence. This is consistent with Bernstein's (1970) theory. Bernstein suggests that middle class children use a style of communication which encourages the speaker to focus on the experiences of others, as these are different from those of his own. The lower SES children, on the other hand, are hypothesized as using a

style that is less precise and literal in its description of events, and which is relatively personal to the speaker.

Clearly, such egocentric speech processes could have been important in determining the results of several of the studies described above. However, there is little evidence concerning the functioning of such processes in situations where specific information is to be transmitted from one person to another. For the most part, the data reported comes from analysis of discoursive speech in which the communicator is retelling an event, or expressing an opinion.

The selective summary of data outlined above indicates that, in most of the early work on SES differences in communicative effectiveness, the main concern has been with determining if such differences exist. There was little attempt to determine the nature of the observed differences. Future research must be less global with respect to the type of communication being studied, and an attempt must be made to determine if one or two variables (e.g., vocabulary) carry most of the burden for producing the obtained differences across SES levels.

For both theoretical and applied reasons, it is important to determine if the difficulties found in lower SES children are essentially due to problems in comprehension (e.g., problems related to a child understanding the logical relations implied in a communication); or if they are due to problems of expression (e.g., the child understands the logical relationships, but is unable to communicate these verbally). There are, of course, degrees of seriousness even within each of these types of problems. For example, failures in comprehension can be caused simply by a limited vocabulary, rather than a failure to comprehend the basic logic of a message. Further, it should be noted that failures in communication due to inadequate comprehension can be the fault of inadequacies in either the communicator or the listener; inadequate expression is a problem whose fault

is more likely to be restricted to the communicator.

The present study attempted to isolate one particular type of communication which appears to have important characteristics: The transmission of information involving the use of conditional logic (viz., the idea that an event may or may not take place depending on the nature of another event which precedes it). Bereiter and Engelman (1967) point out that the use and understanding of the conditional is essential in a number of activities such as arithmetic, reading, and language skills. Further, they report that lower SES preschool children appear to have great difficulty acquiring use of the conditional (though comparable data for middle SES children were not collected.

The following issues were examined in this study. (a) If vocabulary effects are minimized, will there be SES differences in the use of conditional forms by caucasian children who have reached the fifth grade? (b) Even if SES differences occur in the use of recognizable conditional forms, will children within the same SES be able to transmit conditional information to one another? (c) If SES differences are found in transmission of conditional information, are they attributable to lack of comprehension of the conditional logic, or to difficulty in expressing the logic?

In order to reduce the effects of SES differences in vocabulary, communicational materials were selected which could all be labelled with common names familiar to all the children; further, the actions required in the communicational tasks were also easily labelled.

Method

Subjects

The experiment tested 132 children (70 girls and 62 boys) in five classrooms of the Kettering Elementary School, Wayne, Michigan. All children were were caucasian, in the fifth grade, and had achieved normal age-grade placement.

To determine SES, information concerning place and type of parental employment was obtained from school records and biographical data collected by the teachers. First, the parental occupation scale of SES developed by Brent (1967) was used to assign children to SES-levels. In this scale, middle SES occupations are those requiring symbolic cognitive operations (primarily abstracting). Lower SES occupations are those in which object manipulation is primary, and symbol manipulation is minimal. A total of 50 occupational groupings was obtained from the present sample. Three faculty members in the Department of Psychology at Wayne State University assigned all 50 occupations to SES levels on the bases of the Brent criteria; inter-rater agreement was 80%.

The above procedure for determining SES was compared to the Warner, Meeker, and Eels (1960) seven point revised scale of social status. All subjects who were assigned to the middle SES group would be categorized at or above level four on the Warner, Meeker, and Eels scale. All subjects who were assigned to the lower status group would be categorized at or below level three on the same scale.

Subjects in the experiment were assigned to middle and lower status groupings in the above mentioned manner. Eighty subjects were classified as lower SES and 52 subjects were classified as middle SES. Forty-eight of the lower SES subjects were randomly selected and were formed into 24 lower-lower dyads (e.g. lower class communicator and listener.) Twenty middle SES subjects were randomly selected and were formed into 10 middle-middle dyads. Twelve lower-middle dyads were also formed by randomly selecting 12 lower and 12 middle SES subjects. Finally, 20 middle-lower dyads were formed by randomly selecting 20 middle and 20 lower SES subjects.

Experimental Tasks

A two person communication game was designed for the experiment. Two children were seated at opposite ends of a table and they were separated by a

partition which prevented them from seeing each other.

In all the games, materials for the communicator and listener were identical (e.g. each child had the same game sheet or set of blocks in front of him).

In game 1, the communicator was given a sheet of manila paper with a red circle (2.5 inch diameter) on the far left, a green circle (3.5 inch diameter) on the far right, and the communicator was also given a penny. The rule he had to follow was: Whenever E placed a white circle in the center of the game sheet, the communicator had to place his penny on the red circle and whenever E placed a black circle in the center of the game sheet, the communicator had to place his penny on the green circle. All conditional figures (black or white circles) were always placed along the center line of the game sheet. Three pairs of sheets were constructed so that all positional variations of the figures (along a centered line) could be displayed. Any pair of children received one of these three arrangements. Other materials in the game were two circles (one black and one white) equal in diameter to those pasted on the manila sheets, and a penny.

Games 2 and 3 were similar to game 1 with the exception that different geometrical figures and different coins were used. The same type of conditional rule had to be followed. Game 4 was played with playschool children's blocks. In game 4 the communicator was presented with a pair of red blocks (the left block standing up and the right block lying down). The rule he had to follow was whenever E placed another vertically standing red block to the right of the other two blocks, the communicator had to place the middle red block in an upright position, and whenever E placed a green block to the right of the other two blocks, the communicator had to lay the far left blodk down.

Procedure

The E was introduced to each classroom of children and he told them that he was interested in the ways children learn how to play games and in the ways they tell each other how to play games. He also informed them that he would be playing some games with them in the course of the next few days. The games would be played with two people at a time and one person would be shown how to play the game. Then this person would tell the person on the other side of the table how to play the games. Each pair of children would be separated by a screen so that they could not see each other.

Two S's were tested at a time (always between 9:30 and 10:30 A.M., and in a small well lit conference room). E told both S's that he would show the communicator how to play the games first.

The order in which each pair of children played the four experimental games was counterbalanced. Positional variations of the figures contained in the games were randomly selected for each pair of children. Before each game began, the communicator was asked to identify the names and colors of the geometric figures being used in the game. In order for the communicator to understand how the game was played he needed to use a form of conditional logic (e.g., If I do this, this happens, and if I do that, that happens). The E told the communicator: "I want you to watch what I am going to do. Watch very carefully now." The E demonstrated how the game was played, using the following verbalizations: "When I do this, this happens, but when I do this, this happens." When the communicator indicated that he understood how the game was played, E read the following instructions. "I want you to pretend that I don't know how to play the game, tell me how to play the game, show me where my coin, block, etc. goes." The communicator was required to tell E verbally and to demonstrate motorically how the game was played. These points

were emphasized to the communicator. If the communicator demonstrated that he understood how to play the game, phase two of the experiment began, otherwise the game was redemonstrated until the communicator could demonstrate his comprehension.

Phase two of the experiment required that the communicator tell the listener of the dyad how the game was played (as described above). The E told the communicator: "I'm going to put this...or this... (E points) down on the listener's sheet of paper or side of the table, but I'm not going to tell you which I'm going to put down. I want you to tell the listener how he plays the game. Tell the listener where he puts his (coin, block, etc.). Remember, I'm not going to tell you which I'm going to put down." If the communicator had any questions E repeated these instructions.

Results

The IQ scores based on the Otis-Lennon Test of Mental Abilities were available from school records for 60 of the 80 lower SES children (75%) and for 46 of the 52 middle SES (88%). For the lower SES, the mean IQ was 99.1 (range of 78-130) for the middle SES it was 101.5 (range of 79-129). Since the unavailable data data in both SES groups appeared to be missing for equivalent reasons (recent transfers into the school system, illness on the day of testing, etc.) it seems that the obtained scores are representative of the entire sample. Clearly, there is little difference in these scores for the two SES levels. This is, to some extent, the result of the selection criterion set by the Es that all children tested should be at their appropriate age-grade placement; thus children of both very high and very low IQ were likely not to be sampled. The IQ scores are sufficiently comparable for the two SES levels that any differences in communicational performance must probably be attributed to other variables.

None of the children who served as communicators in the experiment had difficulty in comprehending the rules of the games. Two dependent variables were measured:

the number of errors made by the listener in each dyad, and the number of correct conditional communications given by each communicator (i.e., communications transmitting the two parts of each "if...then" aspect of the conditional information). Since each listener received a communication concerning each of four games and each game required two actions, it was possible for a listener to make a maximum of eight errors.

Error data for the four experimental groups are shown in Table 1. A

Insert Table I about here

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2 x 2 analysis of variance (lower versus middle SES communicators x lower versus middle SES listeners) for proportional frequencies was performed over these data and is summarized in Table 2.

Insert Table 2 about here

The data show that SES of the listener is not significantly related to errors by the listeners in responding to conditional communications. On the other hand, SES is the communicator is a highly significant source of variance. These effects can be seen clearly in Table 1, where it is evident that very few errors are made by either middle or lower SES children when responding to conditional communications from middle SES children. On the other hand, when the communicator is lower SES, the listener errors jump more than four-fold.

Turning to an analysis of the data for the communicators, the reason for the significant communicator effects in Table 1 immediately become apparent. The middle SES communicators very consistently emitted messages involving the two critical aspects of the conditional task, Mean = 3.87 out of four opportuni-

ties per child; thus the middle SES communicators used the complete conditional form in approximately 97% of their messages. On the other hand, the corresponding data for the lower SES communicators indicated a Mean = 1.77; thus the completed conditional appeared only in approximately 46% of their messages. The difference between means for middle and lower SES groups is highly significant, $t = 3.1$ with 64 df, $p < .01$.

Finally, it should be noted that sex differences were largely absent in the present data. Since the lower SES communicators constituted by far the largest source of erroneous performance in this study, an examination of performance in this group will present the clearest picture of the relationship between sex differences and communication of the conditional. Among the lower SES communicators, 11 boys and 13 girls communicated to lower SES listeners, while 5 boys and 7 girls communicated to middle SES listeners; thus the ratio of boy to girl communicators was approximately equal for the listeners at the two SES levels. (Among other things, this demonstrates that the lack of a significant difference in performance between thes two listener goups can not be attributed to lower SES listeners having the advantage of a greater percentage of girl-communicators than the middle SES listeners.) It thus becomes appropriate to pool the data across the two levels of listener SES. Doing this, we find that in the 16 dyads with male communicators, the average number of listener errors was 4.4; in the 20 dyads with female communicators, the average number of listener errors was 4.5. This difference does not approach significance, with $t < 1.00$. If we score the messages transmitted by these lower SES communicators for correct use of the conditional, we find that the mean number of correct uses for the 16 male communicators was 1.5; the mean number for the 20 female communicators was 1.8. Again, this difference fails to approach significance.

Discussion

A number of important implications are suggested by the present data. First, it appears that by the fifth grade, the lower SES children in the present study were able to comprehend verbalizations in the conditional logic as well as the middle SES children. This is indicated by the fact that both groups did approximately equally well in responding, as listeners, , to conditional information. On the other hand, despite the fact that IQ was constant across the two SES levels, lower SES children were poor at communicating conditional information. For the most part, their inadequate performance appears attributable to factors very much akin to the Piagetian notion of egocentric speech.

Three types of responses made by the lower SES communicators were suggestive of an egocentric speech interpretation. First, the lower SES child was often satisfied with his message after having presented only part of the required information. Thus the message was often transformed from a two part conditional to a one part imperative. The appropriate message had the form "If E does A, you do B; if E does X, you do Y." The lower SES communicator had a tendency to change this to the form: "When E does A, you do B." This transformation is particularly interesting because, immediately prior to it, the lower SES communicator had shown E that he could repeat the instructions E had given him. However, there was an important difference between the circumstances of the lower SES communicator's message to E and to a S-listener. The E was visible to the child, while the S was not; therefore nonverbal, motoric communication was possible when the child communicated with E, but not when he communicated with the S-listener. Perhaps the strain of having to verbalize his communication was disruptive for the lower SES communicator in a way that it was not for the middle SES child.

A second type of response which occurred primarily among lower SES communicators also is consistent with an egocentric speech interpretation, and

supports the observations made in the paragraph above. The lower SES communicators tended to manipulate the experimental materials motorically while talking to their listeners. In Piagetian terms, their actions imply that for lower SES communicators, the communication is not decentrated from the child's concrete perceptual motor activity, and consequently the communication is merely a reflection of that activity. This type of motoric manipulation was noticably lacking among the middle class communicators.

A third type of inaccurate communication, though rare, was also only given by lower class communicators and this particular communication also indicated the egocentric nature of lower class communications. Approximately 23% of the SES communicators at times gave information that was accurate for the communicato , but not for the listener while none of the middle SES children did this. For example, one communicator told a listener to put his coin on the figure that was closest to the blackboard. Since the orientation of the communicator toward the blackboard was different from that of the listener, this information led to an incorrect response. By giving communications of this type, it was clear that the speaker did not adequately represent the listener's perspective.

It should be noted that the present data stand in marked contrast to the data from several previous studies that attempted to assess SES differences in ability to use language. For example, the lower SES listeners were found to be at a disadvantage in interpreting communications from middle SES children in the previously described studies by Peisach (1965) and by Krauss and Rotter (1968). Why the discrepancy between these sets of data and those of the present study? The present writers suggest that the present study is distinguished from the others in that any advantage in vocabulary size which might characterize the middle SES children could not have had an important effect on performance. At

any rate, the discrepancy points up the fact that it is important to know the characteristics of the material being communicated when attempting to assess the relative performance of lower and middle SES children. Further, the difference in results for listeners, in these two studies, suggests that Peisach's Ss were more troubled by inadequate vocabulary than by inadequate comprehension of the logical forms being communicated to them.

Note that in the present study both lower and middle SES listener were equally confused by lower SES communicators, while they performed equally well when the communicators were middle SES. This is further evidence against the "cultural gap" hypothesis. There was no indication in this study that children of the same SES could understand each other better than they could understand children of a different SES.

Turning to the issue of remedial education, it appears that it is not necessary to teach the logic of conditional reasoning to the lower SES children of the present study. They require remedial attention with regard to their difficulty in expressing the conditional logic in verbal form. Further, there is some indication that these children have a general difficulty that transcends problems of communicating the conditional - this difficulty is the inability to take the perspective of their listeners in attempting to communicate information. In short, the lower SES children in this study had a strong tendency to display egocentric speech.

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Table 1

Means and Standard Deviation for Number of Errors by Listeners as a Function of SES of Communicator and SES Listener, and Number of Dyads on which Data are Based

SES of Listeners	SES of Communicators					
	Middle SES			Lower SES		
	Mean	S.D.	N	Mean	S.D.	N
Middle SES	.80	1.08	10	3.75	2.95	12
Lower SES	.95	.80	20	4.87	3.13	24

Table 2

Analysis of Variance over Listener Errors

as a Function of SES of Listeners and Communicators

Source	df	MS	F
Communicator SES	1	212.1	35.9
Listener SES	1	6.8	1.2
Interaction	1	3.5	0.59
Error (within cell)	62	5.9	